
D-channel maintenance

There are four types of DCH tests for the QPC757 DCHI card. The MSDL card performs local and remote loopback tests.

- | | |
|-------------------|---|
| TEST 100 N | Perform interrupt generation test on DCHI N. |
| TEST 101 N | Perform loopback mode test on DCHI N. |
| TEST 200 N | Perform interrupt handler test on DCHI N. |
| TEST 201 N | Perform interrupt handler-to-link interface path test |

The DCH tests 100 and 101 are hardware tests, while the 200 and 201 test the DCH software.

CAUTION

The DCHI tests must be executed in sequential order.

DCH tests 100 and 101 (QPC757 DCHI card only)

DCH tests 100 and 101 are isolated hardware tests. See Figure 13. Test 100 checks interrupt generation on the DCHI. Test 101 checks the DCHI loop-back capability. If either test fails, either a faulty DCHI or a contention problem is indicated. A test failure initiates DCH error messages.

Tests 100 and 101 must be run in sequential order (tests 200 and 201 may follow). Established calls will stay up, but new calls cannot be placed.

The DCH link must be in the reset state when these tests are run. The reset state can be established when the status of the D-channel is “established” (EST) or “released” (RLS) by using the following:

LD 96

STAT DCH N (responds either EST or RLS)

RST DCH N

If the DCHI is disabled, it must be enabled before reset can be established by using the following:

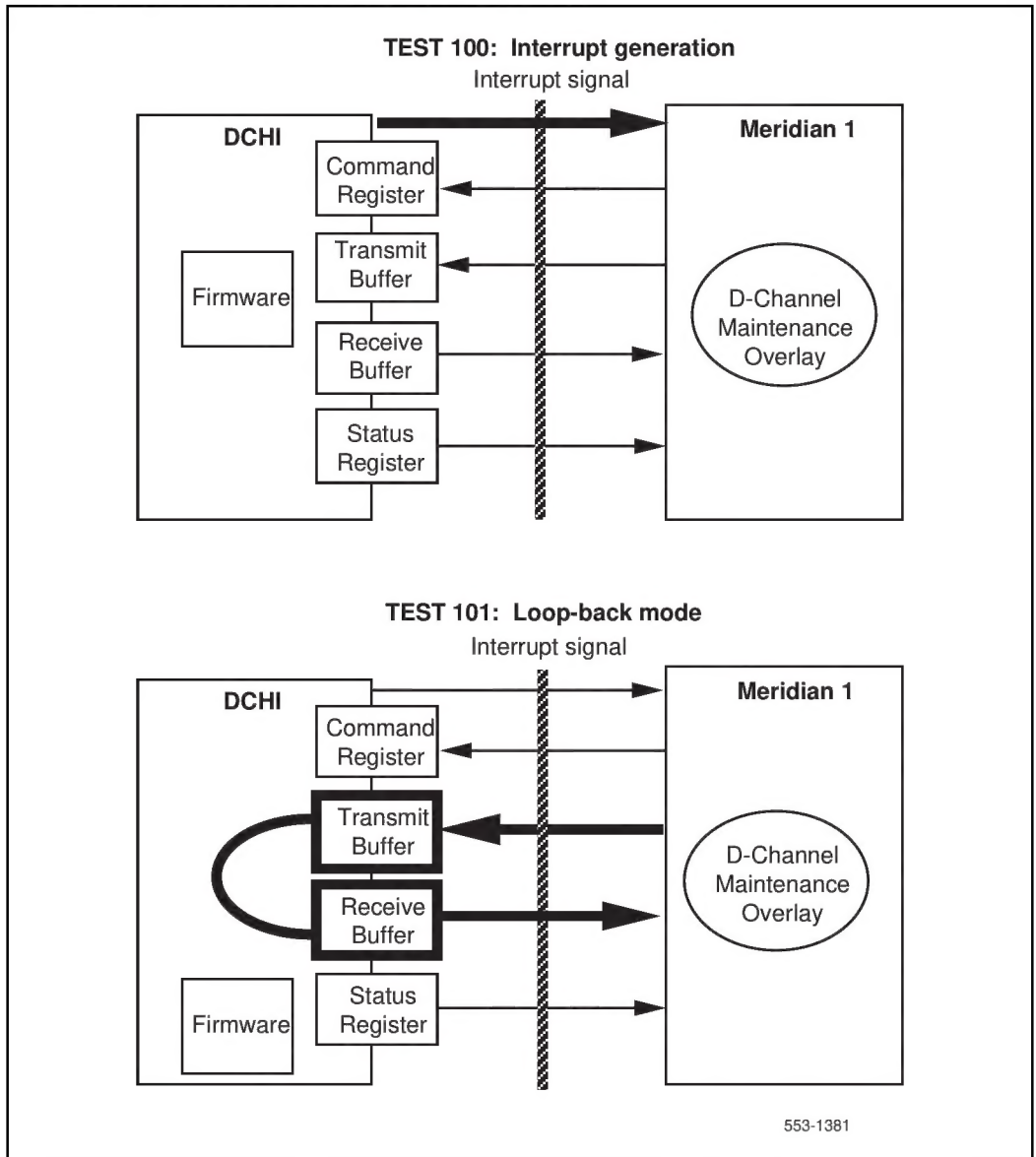
LD 96

STAT DCH N responds DSBL

ENL DCH N if a problem caused the disabled state, RLS will occur; if the disabled state is cleared, status will be EST

RST DCH N

Figure 13
DCH tests 100 and 101 (QPC757 DCHI card only)



DCH tests 200 and 201 (QPC757 DCHI card only)

DCH tests 200 and 201 are software tests. See Figure 14. Test 200 monitors the DCHI interrupt handler. Test 201 checks the interrupt handler-to-link interface path. If either test fails, software problems are indicated. A test failure initiates DCH error messages.

Tests 200 and 201 must be run sequentially after tests 100 and 101. Established calls will stay up, but new calls cannot be placed.

The DCH link must be in the reset state when these tests are run. Reset can be established when the status of the D-channel is established (EST) or released (RLS). Use the following:

LD 96

STAT DCH N (responds either EST or RLS)

RST DCH N

If the DCHI is disabled, it must be enabled before reset can be established. Use the following:

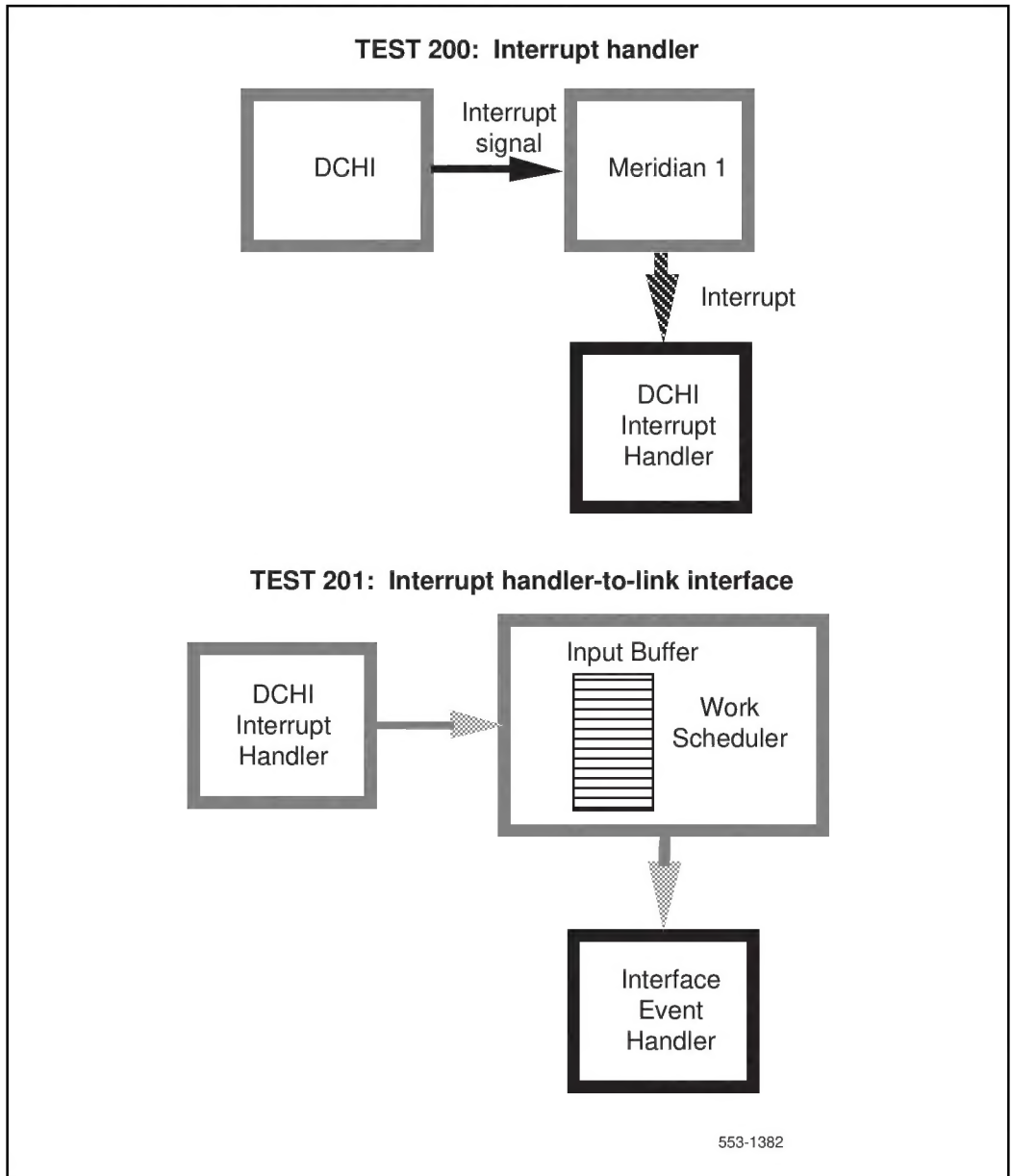
LD 96

STAT DCH N responds DSBL

ENL DCH N if a problem caused the disable state, RLS will occur; if the disabled state is cleared, status will be EST

RST DCH N

Figure 14
DCH tests 200 and 201 (QPC757 DCHI card only)



MSDL local loopback test (NT6D80)

See Figure 15. Before beginning this test.

- 1 Place the D-channel must in test state, by entering:
ENL TEST DCH x, where **x** is the logical DCH number.
- 2 Place the MSDL in loopback mode. Enter
ENL LLB DCH x command, where **x** is the logical DCH number.
- 3 Then perform the loopback test. Enter
TEST LLB DCH x command, where **x** is the logical DCH number.

The test checks both MSDL expedited and normal (ring) interfaces.

The response for the expedited interface that carries urgent signaling and maintenance messages between the Meridian 1 CPU and the MSDL MPU follows:

DCH : X XDU TEST CONFIRM TIME : <time of day>
TEST : PASS (or FAIL)

X is the DCH logical number

XDU is the expedient message sent around the loop.

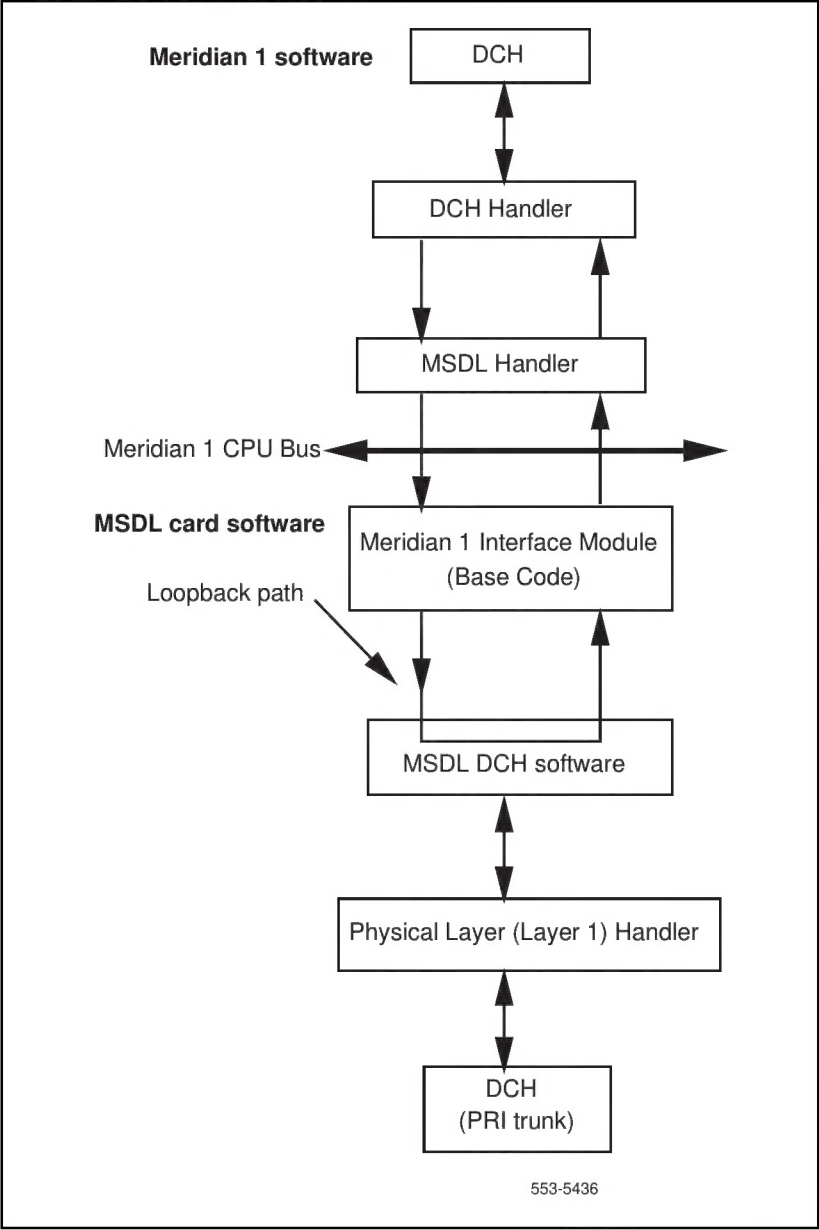
The response for the ring interface that transmits operation data between the Meridian 1 CPU and the MSDL MPU follows:

DCH : X DU TEST CONFIRM TIME : <time of day>
TEST : PASS (or FAIL)

- 4 After completing the test, remove the D-channel from the test state:
DIS TEST DCH x.
- 5 If the test fails, check the status of the MSDL card, used by this DCH link, with the **STAT MSDL y FULL** command, where **y** is the physical port (DNUM) of the MSDL card.
- 6 If the MSDL card may be faulty, disable the card and perform a reset self-test.
DIS MSDL y
RST MSDL y
SLFT MSDL x
- 7 If the card passed the test, the problem may lie in incompatible software.

Refer to *Multi-purpose Serial Data Link description* (553-3001-195) for more information on the MSDL card.

Figure 15
Local loopback test (NT6D80)



MSDL remote loopback tests (NT6D80)

See Figure 16. Before beginning this test, verify the following:

- D-channels on both switches are configured on MSDL cards
- DCH links on both switches are set to TEST mode
- DCH at Switch B is in remote loopback mode (RLB)
- remote capability (RCAP) is MSDL

- 1 Place Switch B in TEST mode. Enter **ENL TEST DCH y**.

Note: **DCH x** or **DCH y** = DCH # you want to test.

- 2 Place the Switch B DCH link in remote loopback state (RLB) by entering **ENL RLB DCH y**.

- 3 Place Switch A in TEST mode. Enter **ENL TEST DCH x**.

- 4 From Switch A, perform the following test:

TEST RLB x

This test starts the remote loopback test on MSDL DCH x.

The result of the remote loopback test is displayed on Switch A's console in the following format:

DCH : X RLB TEST CONFIRM TIME : <time of day>

TEST : PASS

TEST : FAIL - NO DATA RCV FAR END

TEST : FAIL - CORPT DATA RCV FAR END

TEST : FAIL - REASON UNKNOWN

TEST : FAIL may indicate a problem in the physical link between the two switches, or faulty equipment in either switch. Check the connections, and verify the status of the MSDL and PRI trunk cards used for this link.

- 5 Place the Switch B DCH link back to idle state with the **DIS RLB y** command.

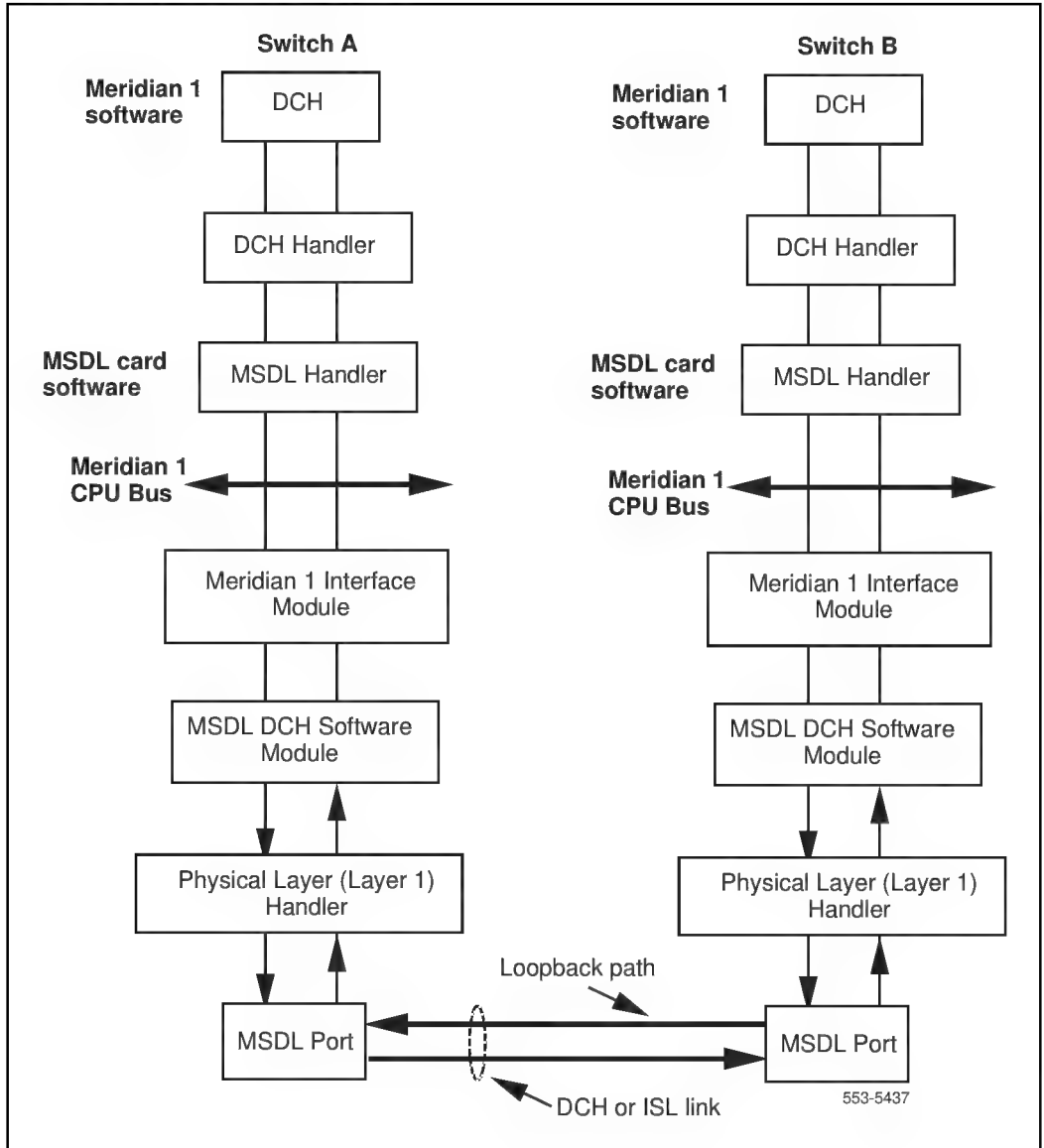
- 6 After the test is complete, remove both sides from the test state:

DIS TEST DCH y

DIS TEST DCH x

- 7 If you think the MSDL card used in either switch has failed, check the status of the DCH link and the status of the MSDL card by entering **STAT MSDL x FULL**.
- 8 If the MSDL card may be faulty, disable the card and perform a self-test:
DIS MSDL x
SLFT MSDL x
- 9 If the card passed the test, the problem may lie in incompatible software. Refer to *Multi-purpose Serial Data Link description* (553-3001-195).

Figure 16
Remote loopback tests (NT6D80)



Protocol Log (PLOG)

The count of D-channel errors is stored in the Protocol Log (PLOG). The PLOG is printed by using LD 96 as shown in the PLOG status check.

Protocol errors can be the result of PRI transmission problems and re-start procedures or a protocol mismatch with the far end. The PLOG counters are cleared after the PLOG is printed, or the DCHI/MSDL card is enabled.

Note: When a protocol counter overflows, the PLOG is printed automatically and the counters are cleared.

When the PLOG has non-zero counters, check the PRI status and alarms as shown. See Table 10 for the PLOG for X11 release 17 and earlier. See Table 11 for the PLOG for X11 release 18 and later.

Procedure 8 PLOG status check

- Check the contents of the PLOG using the following:

LD 96

PLOG DCH x

Response with **X11 release 17 and earlier:**

DCH x I xxxx

yy zz 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

where:

I = incoming

xxxx = system real time (in hexadecimal)

yy = maintenance indication primitive ID

zz = maintenance indication task ID

00 00 ... = protocol error counters

Response with **X11 release 18 and later:**

DCH : XX MAINT CONFIRM TIME: <time of day>

COUNTER	VALUE
1:	12
12:	8
20:	15
N:	XX
- If there are PRI bit rate or frame errors, assume there is a PRI problem.
- If there is no problem with the PRI but there are a large number of protocol errors, report a protocol problem.

Table 10
Protocol log (X11 release 17 and earlier)

Format	
DCH x xxxx yy zz 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	
Protocol counters	
1	count of missing PRI handshakes
2	count of peer initiated re-establishment link
3	count of unsuccessful retransmit N200 of SABME
4	count of unsuccessful retransmit N201 of DISC
5	count of N(R) errors
6	count of information fields with length greater than N201
7	count of undefined frames
8	count of I fields but not allowed
9	count of FRMR frames
10	count of CRC error frames
11	count of REJ frames
12	count of messages with less than 4 octets
13	count of undefined protocol discriminators
14	count of undefined message types
15	count of messages missing one or more mandatory information elements
16	count of messages with one or more undefined information elements

Table 11
Protocol log (X11 release 18 and later) (Part 1 of 3)

Format	
DCH : XX MAINT CONFIRM TIME: <time of day> COUNTERVALUE	
Protocol counters	
1	count of missing PRI handshakes
2	count of peer initiated re-establishment link
3	count of unsuccessful retransmit N200 of SABME
4	count of unsuccessful retransmit N200 of DISC
5	count of N(R) errors
6	count of information fields with length greater than N201
7	count of undefined frames
8	count of information fields that are not allowed to contain information
9	count of FRMR frames received from the far end
10	count of CRC error frames received from the far end
11	count of REJ frames received from the far end
12	count of layer 3 messages with less than 4 octets
13	dummy counter, always zero
14	count of undefined layer 3 message types
15	count of layer 3 messages missing one or more mandatory information elements
16	count of layer 3 messages missing one or more undefined information elements
17	count of layer 1 reports of no external clock being received
18	count of aborted frames
19	count of SABME frames received with incorrect C/R bit

Table 11
Protocol log (X11 release 18 and later) (Part 2 of 3)

20	count of supervisory frames received with F = 1
21	count of unsolicited DM responses with F = 1
22	count of unsolicited UA responses with F = 1
23	count of unsolicited UA responses with F = 0
24	count of DM responses with F = 0
25	count of times that no response was received from the far end after N200 transmissions retransmissions of RR or RNR
26	count of frames received with incorrect header length
27	number of times owner receiver busy condition was entered
28	number of times peer receiver busy condition was entered
29	count of messages with call reference length greater than 2
30	count of optional IEs received with invalid contents
31	count of mandatory IEs received with invalid contents
32	count of messages received with IE's not ordered correctly
33	count of IEs which were repeated in received messages, but are only allowed to appear once per message
34	count of IEs received with length exceeding the specified maximum length for the IE
35	count of layer 3 messages from far-end with invalid call reference flag value of 0
36	count of layer 3 messages from far-end with invalid call reference flag value of 1
37	count of layer 3 messages from far-end with invalid global call reference
38	count of layer 3 messages from SL-1 that are too short
39	count of layer 3 messages from SL-1 containing an undefined message type
40	count of layer 3 messages from SL-1 missing mandatory IE(s)
41	count of layer 3 messages from SL-1 containing unsupported IE(s)

Table 11
Protocol log (X11 release 18 and later) (Part 3 of 3)

42	count of layer 3 messages from SL-1 containing invalid operational IE(s)
43	count of layer 3 messages from SL-1 containing invalid mandatory IE(s)
44	count of layer 3 messages from SL-1 with IE(s) out of order
45	count of layer 3 messages from SL-1 containing repeated IE(s)
46	count of layer 3 messages from far-end with an invalid call reference length
47	count of layer 3 messages from SL-1 with an invalid call reference flag value of 0
48	count of layer 3 messages from SL-1 with an invalid call reference flag value of 1
49	count of layer 3 messages from SL-1 with an invalid global call reference
50	count of unexpected layer 3 messages received from the far-end
51	count of unexpected layer 3 messages received from the SL-1
52	count of unexpected layer 3 timer expirations
53	count of protocol messages received when D-channel is not in service or waiting for a Service Acknowledge message

Replacing the DCHI or MSDL

Follow this procedure to replace the QPC757 DCHI, or NT6D80 MSDL card.

Procedure 9

Replacing the DCHI or MSDL card

CAUTION

Firmly touch the metal frame of the cabinet to discharge static electricity from your body before handling circuit cards.

- 1 Disable the D-channel.
LD 96
DIS DCH x
- 2 Disable the asynchronous port on the card (if equipped).
X11 release 18 and later
LD 37
DIS TTY x

X11 release 17 and earlier
LD 48
DIS ESDI x
- 3 Set the ENB/DIS switch to DIS (if equipped).
- 4 Disconnect cables on faceplate.
- 5 Remove the DCHI or MSDL from the shelf.
- 6 Make sure that the new card switch settings are the same as the ones on the old DCHI card.
- 7 Install the new card in the appropriate slot.
- 8 Connect the faceplate cables to the new card.
- 9 Set the ENB/DIS switch to ENB (if equipped).
- 10 Enable the D-channel.
LD 60
ENL DCH x

